

What is claimed is:

- 5 *Sub 1*
1. A stored energy tracking system for a vehicle having a stored energy source defining a stored amount of energy SAE at any given time, the system comprising:
a sensor installed on the vehicle for sensing the SAE of the vehicle;
a vehicle subsystem including a wireless communication unit installed on the vehicle and operatively coupled to the sensor for transmitting SAE information corresponding to a SAE sensed by the sensor;
a central station including a computer system coupled in wireless communication with said wireless communication unit for receiving and processing SAE information transmitted by said wireless communication unit.
 - 10 2. A stored energy tracking system for a vehicle, as in claim 1 where the vehicle is an electric powered vehicle having a battery power source, the SAE is the state of charge SOC of the battery, and the sensor comprises a sensor for sensing the SOC of the battery.
 - 15 3. A stored energy tracking system for a vehicle as in claim 1, wherein the central station comprises a display device and said processing SAE information comprises displaying SAE information.
 - 20 4. A stored energy tracking system for a vehicle as in claim 1, wherein the central station comprises a recording device and said processing SAE information comprises recording SAE information.
 - 25 5. A stored energy tracking system for a vehicle as in claim 1, wherein said central station comprises a computer programmed to compare a sensed SAE with a previously sensed SAE and to generate a first signal in response to a change between compared SAEs greater than a predefined value.

6. A stored energy tracking system for a vehicle as in claim 5, wherein the vehicle subsystem further comprises:

a display device installed on the vehicle;

a processor operatively coupled to the display device and in wireless communication with said computer system, and programmed to respond to a first signal from the computer system to display a first warning message on the display device.

7. A stored energy tracking system for a vehicle as in claim 6, wherein said central station comprises a computer programmed to determine whether the sensed SAE is greater than a predefined minimum SAE value and to generate a second signal in response to the sensed SAE being less than a predefined minimum SAE value.

8. A stored energy tracking system for a vehicle as in claim 7, wherein the vehicle subsystem processor is further programmed to respond to the first signal from the computer system and to display a warning message on the display device.

9. A stored energy tracking system for a vehicle as in claim 1, wherein said central station comprises a computer programmed to determine whether the sensed SAE is greater than a predefined minimum SAE value and to generate a low SAE signal in response to the sensed SAE being less than a predefined minimum SAE value.

10. A stored energy tracking system for a vehicle as in claim 9, wherein the vehicle subsystem further comprises:

a display device installed on the vehicle;

a processor operatively coupled to the display device and in wireless communication with said computer system, and programmed to respond to a low SAE signal from the computer system to display a warning message on the display device.

11. A vehicle sharing system operable with at least one port at which one or more vehicle from a fleet of vehicles may be shared among a plurality of users, each vehicle having a stored energy source defining a stored amount of energy SAE at any given time, the system comprising:

5 a sensor associated with and installed on each vehicle for sensing the SAE of the associated vehicle;

a vehicle subsystem including a wireless communication unit associated with and installed on each vehicle and operatively coupled to the sensor on the associated vehicle for transmitting SAE information corresponding to a SAE sensed by the sensor;

10 a central station coupled in wireless communication with said wireless communication units, including a tracking system that provides vehicle location information corresponding to the location of each vehicle and a computer system for receiving SAE information transmitted by said wireless communication unit and programmed to process SAE information and vehicle location information to select and allocate vehicles to users based on SAE information and vehicle location information.

12. A system as recited in claim 11, wherein:

20 the central station computer system is further programmed to define a vehicle search group for each port in which one or more vehicles from the fleet may be present at any given time; and

the central station computer system is programmed to select and allocate a vehicle for a user at a given port from the vehicle search group defined for that port.

25 13. A system as recited in claim 12, wherein the central station computer system is further programmed to process vehicle location information for a vehicle due to arrive at a given port, to provide an estimated time of arrival of the vehicle at that port and for including the vehicle in the vehicle search group for that port if the estimated time of arrival is within a predefined time period.

14. A system as recited in claim 12, wherein:
each vehicle comprises an electric powered vehicle having a battery power source and the
SAE is the state of charge SOC of the battery power source;
each port includes a charging facility for selectively coupling to a vehicle to increase the
SOC of the vehicle over a charging time period;
said central station computer system is programmed to process vehicle location
information and SAE information to include a vehicle in the vehicle search group of a given port
if the vehicle is located at a charging facility at the port and has a charging time period which is
due to expire within a predefined time period.

15. A system as recited in claim 11, wherein:
each vehicle comprises an electric powered vehicle having a battery power source and the
SAE is the state of charge SOC of the battery power source;
each port includes a charging facility for selectively coupling to a vehicle to increase the
SOC of the vehicle over a charging time period;
said central station computer system is programmed to process vehicle location
information and SAE information to select a vehicle located at a given port for coupling to the
charging facility at that port, based on the SAE information for the vehicle.

16. A system as recited in claim 11, wherein:
each vehicle comprises an electric powered vehicle having a battery power source and the
SAE is the state of charge SOC of the battery power source;
each port includes a charging facility for selectively coupling to a vehicle to increase the
SOC of the vehicle over a charging time period;
said central station computer system is programmed to process vehicle location
information and SAE information for determining an charging order for a plurality of vehicles
located at a port based on the SAE of each vehicle in the plurality of vehicles.

17. A system as recited in claim 16, wherein said charging order is defined by the
order of the SAEs of the vehicles, from the lowest SAE toward the highest SAE.

18. A system according to claim 16, wherein:

5 said charging facility defines a charging rate for each vehicle, wherein the charging rate comprises the vehicle's increasing SOC over the charging period and wherein a plot of the charging rate of each vehicle includes a generally linear region below a first SOC level and a generally nonlinear region above the first SOC level;

said central station computer system is further programmed to assign a vehicle to a charger if the state of charge of the SOC the vehicle is such that the charger will be operating in its linear charge region upon coupling to the vehicle.

10 19. A stored energy tracking method for a vehicle having a stored energy source defining a stored amount of energy SAE at any given time, the method comprising:

sensing the SAE of the vehicle with a sensor installed on the vehicle;

15 transmitting SAE information corresponding to a SAE sensed by the sensor with a wireless communication unit installed on the vehicle;

receiving and processing SAE information transmitted by said wireless communication unit at a central station.

20 20. A method as in claim 19 where the vehicle is an electric powered vehicle having a battery power source, the SAE is the state of charge SOC of the battery, and the step of sensing the SAE comprises sensing the SOC of the battery.

25 21. A method as in claim 19, wherein the step of processing SAE information comprises displaying SAE information on a display device at the central station.

22. A method as in claim 19, wherein the step of processing SAE information comprises recording SAE information on a recording device at the central station.

23. A method as in claim 19, further comprising:
comparing a sensed SAE with a previously sensed SAE and to generate a first signal in
response to a change between compared SAEs greater than a predefined value; and
displaying a warning message on a display device installed on the vehicle, in response to
the first signal.

24. A method as in claim 23, further comprising:
comparing a sensed SAE with a predefined minimum SAE value and generating a second
signal in response to the sensed SAE being less than a predefined minimum SAE value; and
displaying a warning message on the display device installed on the vehicle, in response
to the second signal.

25. A method as in claim 19, wherein
comparing a sensed SAE with a predefined minimum SAE value and generating a low
SAE signal in response to the sensed SAE being less than a predefined minimum SAE value; and
displaying a warning message on the display device installed on the vehicle, in response
to the low SAE signal.